



### Architects. Design Studio

Déchelette Architecture.  
Philibert and Emmanuelle Déchelette

### Collaborators

Jade Barbier

### Client

Seine Ouest Habitat et Patrimoine

### Contractor

SOHP

### Suppliers

STM-LBTP, Terrio, Philippe d'Art

### Certificate

NF Habitat HQE – Biosourcés niveau 3

### Start and Completion Year

2021-2023

### Gross Area

400 m<sup>2</sup>

### Sustainable and healthy materials or systems

Raw earth façade, stone base, wooden façade

### Photography

Salem

### Contact and more information

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[More information](#)

## *Quatre Cheminées.*

### **8 Social Housing Units**

***Quatre Cheminées. 8 habitages sociaux***

***Quatre Cheminées. 8 viviendas sociales***

Boulogne-Billancourt, France, 2021-2023

**Déchelette Architecture**

### REPORT. Sustainable and Healthy Architecture

In January 2021, Déchelette Architecture won a competition launched by Seine Ouest Habitat et Patrimoine to design a building at 17 Rue des Quatre-Cheminées in Boulogne-Billancourt.

The program is clear: to conceive a four-storey building with eight social housing units and a shop using a wooden structure that promotes the use of environmentally friendly materials

The project stands out for its design, which is marked by simplicity. Déchelette Architecture takes great care to use as many unprocessed and biosourced materials as possible without compromising the comfort of the residents.

To meet these ambitions, the architects have designed a building with a raw earth façade and a stone base on the street side and a wooden façade on the garden side. The use of self-supporting raw earth across four levels of the façade is a first for collective housing in France.

#### Stone, Raw earth, and Wood

In a cradle-to-cradle (C2C) construction approach using low impact materials, the architects chose raw, bio-sourced materials. The use of concrete is kept to a minimum. Except for the ground-floor slab and the circulation core, the project uses three unprocessed and bio-sourced materials: stone, raw earth, and wood.

The self-supporting façade is made of prefabricated rammed earth over four levels, resting on a stone base—an unprecedented approach for collective housing in France. The façade, designed as a monolith, was assembled in just a few days by stacking pre-dried blocks.

Terrio, a young company specialised in the production of prefabricated rammed earth blocks, answered the call for tenders. They crafted and dried the rammed earth blocks in their workshop near Lyon, where the raw earth comes from. They also trained the general contractor, STM-LBTP, in the installation of the blocks on site. Using raw earth on the façade reduces the carbon footprint of the construction (23kgCO<sub>2</sub>eq for rammed earth versus 250kgCO<sub>2</sub>eq for concrete) and economizes materials through a principle of façade purification. Its thermal, acoustic, inertial, and aesthetic properties significantly enhance the comfort of residents in both summer and winter.

The building's framing and structural elements are made of wood, incorporating high-performance acoustic insulation panels made of wood wool. The organic character of the wood, more rural than urban, was chosen for the rear façade to create a dialogue with the landscaped garden.

By using these raw, bio-sourced materials, the project's carbon footprint is significantly reduced, as demonstrated by the operation's carbon balance (PCE: 793kgCO<sub>2</sub>eq per square meter). The relevance of using these low impact materials has been validated by surpassing the initial lowcarbon objectives, achieving the highest level of HQE qualification at level 3.